

Kansas Department of Health and Environment
Regulations Article 45
Underground Hydrocarbon Storage Wells and Associated Brine Ponds

28-45-2	Revoked
28-45-2a	Definitions
28-45-3	Revoked
28-45-3a	Permit Required
28-45-4	Revoked
28-45-4a	Well conversions and reentry
28-45-5	Revoked
28-45-5a	Temporary facility permit
28-45-6	Revoked
28-45-6a	Final permit
28-45-7	Revoked
28-45-7a	Public notice
28-45-8	Revoked
28-45-8a	Modification and transfer of a final permit
28-45-9	Revoked
28-45-9a	Signatories to permit applications and reports
28-45-10	Revoked
28-45-10a	Siting requirements for new hydrocarbon storage wells and facilities
28-45-11	Revoked
28-45-11a	Financial assurance for hydrocarbon storage facility closure

Kansas Department of Health and Environment Regulations Article 45

- 28-45-12 Operations and maintenance plan
- 28-45-13 Emergency response plan and safety and security measures
- 28-45-14 Design and construction of underground hydrocarbon storage wells
- 28-45-15 Monitoring
- 28-45-16 Testing and inspections
- 28-45-17 Groundwater monitoring
- 28-45-18 Record requirements and retention
- 28-45-19 Well workovers
- 28-45-20 Plugging requirements
- 28-45-21 Underground hydrocarbon storage fees
- 28-45-22 Permit required for a brine pond
- 28-45-23 Brine pond application and permit
- 28-45-24 Public notice for a brine pond
- 28-45-25 Renewal, modification, and transfer for a brine pond permit
- 28-45-26 Signatories for a brine pond
- 28-45-27 Financial assurance for brine pond closure
- 28-45-28 Design, construction, and maintenance of brine ponds
- 28-45-29 Groundwater monitoring for brine ponds
- 28-45-30 Brine pond closure requirements

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-2a. Definitions. (a) “Active well” means an unplugged well that is in service or in monitoring status.

(b) “Applicant” means the operator and the owner requesting a permit as specified in this article of regulations. If the operator and the owner are not the same person, the owner and the operator shall jointly submit an application for a permit.

(c) “Brine” means saline water with a sodium chloride concentration equal to or greater than 90 percent.

(d) “Brine pond” means the excavated or diked structure used for the surface containment of brine used in the creation, maintenance, and operation of an underground hydrocarbon storage well.

(e) “Cavern” and “storage cavern” mean the storage space created in a salt formation by solution mining.

(f) “Department” means the Kansas department of health and environment.

(g) “Director” means the director of the division of environment of the Kansas department of health and environment.

(h) “Draft permit” means a document that is pending approval by the secretary to be issued as a final permit.

(i) “Existing storage well” means a well authorized or permitted by the secretary before April 1, 2003.

(j) “Existing brine pond” means a brine pond authorized or permitted by the secretary before April 1, 2003.

(k) “Fracture gradient” means the pressure gradient, measured in pounds per square inch per foot, that will cause the geological formations to physically fracture.

(l) “Freshwater” means water containing not more than 1,000 milligrams per liter of total dissolved solids.

(m) “Hydrocarbon storage well,” “underground hydrocarbon storage well,” and “storage well” mean a well used for the injection or withdrawal of hydrocarbon or liquified petroleum gas into or out of an underground hydrocarbon storage cavern.

(n) “Licensed geologist” means a geologist licensed to practice geology in Kansas by the Kansas board of technical professions.

(o) “Licensed professional engineer” means a professional engineer licensed to practice engineering in Kansas by the Kansas board of technical professions.

(p) “Licensed professional land surveyor” means a professional land surveyor licensed to practice land surveying in Kansas by the Kansas board of technical professions.

(q) “Liner” means the casing normally installed within the production casing.

(r) “Liquified petroleum gas” and “LPG” mean by-products or derivatives of oil and gas, including propane, butane, isobutane, and ethane, maintained in a liquid state under pressure.

(s) “Maximum allowable operating pressure” means the maximum pressure authorized by the department and measured at the product side of the wellhead.

(t) “Maximum allowable synthetic membrane liner leakage rate” means a monitored or a calculated leakage rate of 10 percent of the collection and leak return system capacity.

(u) “Maximum operating pressure” means the maximum pressure monitored during a 24-hour period and measured at the product side of the wellhead.

(v) “Monitoring status” means temporary status for a well that has been placed out of service by removing the product and filling the cavern with brine.

(w) “Municipal population center” means an incorporated city.

(x) “Natural gas” means the gaseous form of hydrocarbon consisting primarily of methane.

(y) “Operator” means the person recognized by the secretary as being responsible for the physical operation of an underground hydrocarbon storage facility or a brine pond.

(z) “Owner” means the person owning all or part of any underground hydrocarbon storage facility or brine pond.

(aa) “Permit” means an authorization, license, or equivalent control document issued to the owner and the operator by the secretary.

(bb) “Permit holder,” “holder of a permit,” and “permittee” mean the owner and the operator issued a permit, as defined in this regulation, by the secretary.

(cc) “Person” means any individual, company, corporation, institution, association, partnership, municipality, township, and local, state, or federal agency.

(dd) “Porosity storage” and “underground porosity storage” mean the storage of hydrocarbon gas in underground porous and permeable strata that have been converted to hydrocarbon gas storage.

(ee) “Pressure gradient” means the ratio of pressure per unit depth expressed as pounds per square inch per foot of depth.

(ff) “Product” means any hydrocarbon, including products and by-products from crude oil, derivatives of oil and gas, and liquefied petroleum gas.

(gg) “Saturated brine” means saline water with a sodium chloride concentration that is equal to or greater than 90 percent.

(hh) “Secretary” means the secretary of the department of health and environment.

(ii) “Solutioning” means the process of injecting fluid into a well to dissolve salt or any other readily soluble rock or mineral.

(jj) “Supervisory control and data acquisition” means an automated surveillance system in which the monitoring and control of storage activities are accomplished at a central or remote location.

(kk) “Underground hydrocarbon storage cavern” means the storage of any hydrocarbon, including liquid petroleum gas and excluding natural gas, in caverns formed by solutioning in bedded salt.

(ll) “Underground hydrocarbon storage facility” and “facility” mean the acreage associated with the storage field with facility boundaries approved by the secretary. This term shall include the brine ponds, wells, wellbore tubular goods, the wellhead, and any related equipment, including any appurtenances associated with the well field.

(mm) “Unsaturated brine” means saline water with a sodium chloride concentration less than 90 percent.

(nn) “Usable water formation” means an aquifer or any portion of the aquifer that meets any of the following criteria:

- (1) Supplies any public water system;
- (2) contains a supply of groundwater that is sufficient to supply a public water system and that currently supplies drinking water for human consumption; or
- (3) contains fewer than 10,000 mg/L total dissolved solids and is not an exempted aquifer.

(oo) “Variance” means the secretary’s written approval authorizing an alternative action to the requirements of these regulations or the standards adopted by these regulations and incorporated into the temporary or final permit. (Authorized by K.S.A. 65-171d; implementing K.S.A. 65-171d and K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-3a. Permit required. (a) No person shall create, operate, or maintain an underground storage well for liquified petroleum gas or hydrocarbon in bedded salt without obtaining a permit from the secretary. The requirements for permit issuance shall be as follows:

(1) Each operator and owner of an existing underground hydrocarbon storage facility shall initially obtain a temporary facility permit as specified in K.A.R. 28-45-5a.

(2) Each operator and owner of an existing underground storage well shall obtain a final permit as specified in K.A.R. 28-45-6a.

(3) The existing permit or authorization for the underground hydrocarbon storage facility shall remain in effect until a temporary facility permit is issued.

(4) The storage of liquified hydrocarbons in caverns constructed in any rock formations other than bedded salt shall be prohibited.

(b) A variance may be granted by the secretary if both of the following conditions are met:

(1) The variance is protective of public health, safety, and the environment.

(2) The applicant or permittee agrees to perform any additional testing, monitoring, or well improvements, or any combination, if required by the secretary.

(c) Each applicant or permittee seeking a variance shall submit a written request, including justification for the variance and any supporting data, to the secretary for review and consideration for approval. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003, effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-4a. Well conversions and reentry. (a) The conversion of an existing well to underground hydrocarbon storage shall be prohibited if the well was not originally designed for hydrocarbon storage, unless the secretary determines that the conversion is protective of public health, safety, and the environment.

(b) The conversion of an underground hydrocarbon storage well for other purposes shall be prohibited, unless the secretary determines that the conversion is protective of public health, safety, and the environment.

(c) The reentry of a plugged liquified petroleum gas or hydrocarbon storage well for the purpose of reactivating activities associated with the underground storage of natural gas, liquified petroleum gas, or liquid hydrocarbons shall be prohibited.

(d) A permittee may convert an unplugged underground hydrocarbon storage well to monitoring status if the following requirements are met:

(1) Each permittee shall verify the integrity of the storage well and cavern by conducting a mechanical integrity test before converting the well to monitoring status.

(2) Each permittee shall run a gamma-density log to verify the roof thickness prior to converting the well to monitoring status.

(3) Each permittee shall meet the requirements specified in the department's document titled "procedure for converting a hydrocarbon storage well to monitoring status, procedure #:UICLPG-4," dated June 2003, which is hereby adopted by reference.

(4) Each permittee of an underground storage cavern that is in monitoring status shall conduct a casing inspection evaluation before placing the cavern into service if a casing evaluation has not been conducted in the last five years. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-5a. Temporary facility permit. (a) Each operator and owner of an existing underground hydrocarbon storage facility shall be required to have a temporary facility permit issued by the secretary.

(b) The temporary facility permit shall supersede any authorization or permit previously issued by the secretary.

(c) Each temporary facility permit application shall include the following information:

(1) The name and location of the facility;

(2) a site map of the facility showing the following:

(A) The facility boundaries and the location and well number of each well, including storage, observation, disposal, and any abandoned wells; and

(B) the location of buildings, roads, railways, right-of-ways, utilities, and any other appurtenances;

(3) the following information for each cavern:

(A) The depth of the top of the salt formation;

(B) the depth of the top of the underground storage cavern;

(C) the total depth of the underground storage cavern;

(D) a schematic of the well construction;

- (E) the storage capacity;
- (F) the type of product stored;
- (G) the operating pressures; and
- (H) a list of dates on which the required tests, logs, or monitoring reports for each underground hydrocarbon storage well were completed; and

(4) a list of requests for variances from the requirements of this article of regulations.

(d) Each applicant shall submit a compliance schedule with the temporary facility permit application, subject to the approval of the secretary, for conducting sonar surveys, integrity tests, and casing evaluations and for the installation of equipment. The compliance schedule shall be incorporated into the permit and may be modified as specified in K.A.R. 28-45-8a. The following requirements shall apply:

(1) The modification or installation of equipment associated with the wellhead, storage well, storage well system, or storage cavern shall be completed within five years after April 1, 2003 for existing underground hydrocarbon storage wells.

(2) A sonar survey shall be conducted for each underground hydrocarbon storage cavern. The following requirements shall apply:

(A) A sonar survey shall be conducted within five years after April 1, 2003 for any underground hydrocarbon storage cavern that does not have a sonar survey or that had a sonar survey conducted before January 1, 1998.

(B) A sonar survey shall be conducted within 10 years after April 1, 2003 for any underground hydrocarbon storage cavern that had a sonar survey conducted on or after January 1, 1998.

(3) A mechanical integrity test and a casing inspection evaluation for each underground hydrocarbon storage well shall initially be conducted within seven years after April 1, 2003.

(e) Each temporary permittee for an underground hydrocarbon storage facility either shall be required to have a final permit for each underground hydrocarbon storage well within five years after April 1, 2003 or shall cease well operations and shall comply with abandonment and plugging requirements as specified in K.A.R. 28-45-20.

(Authorized by and implementing K.S.A. 2002 Supp. 55-1, 117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-6a. Final permit. (a) Each applicant shall submit a completed application for a final permit for each existing underground hydrocarbon storage well to the secretary, on a form furnished by the department, within three years after April 1, 2003.

(b) Each applicant who wishes to construct an underground hydrocarbon storage well shall submit a completed application to the secretary, on a form furnished by the department, at least 180 days before the proposed commencement date for the construction of the new underground hydrocarbon storage well. Well construction shall not begin until the secretary has issued the final permit.

(c) Upon review of each application, one of the following shall be issued by the secretary:

- (1) A final permit, if the application is approved; or
- (2) a notice that the final permit has been denied if the applicant has not complied with the requirements of this article of regulations. The notice shall include justification for the permit denial.

(d) Each temporary permit shall terminate on the effective date of the final permit.

(e) Each application for a final permit shall include a report prepared by a licensed geologist and shall include the following:

(1) An evaluation of the geology and hydrogeology, including cross-sections, isopach and structure maps of the salt formation, and water-level or potentiometric maps;

(2) a regional stratigraphic evaluation;

(3) local and regional structural analyses, including maps, cross-sections, and available geophysical data;

(4) a flood assessment identifying floodplain and flood-prone areas, including the following:

(A) Flood response procedures; and

(B) design criteria for the well and facility equipment; and

(5) an assessment of the potential for ground subsidence.

(f) Each applicant shall submit the following information with the application:

(1) A plan view map showing locations of all water, solution-mining, monitoring, disposal, injection, oil, and gas wells within a one-mile perimeter of the facility's boundary; and

(2) a plan view map of man-made surface structures and activities within a one-mile perimeter of the facility's boundary.

(g) Each permittee of an underground storage well shall submit a compliance audit every 10 years, on a form furnished by the department, for review and consideration for approval for the continued operation of the underground hydrocarbon storage well.

(h) Each permittee shall submit a sample log of well cuttings from any new well drilled at the facility, including new underground hydrocarbon storage wells, monitoring wells, and stratigraphic test holes.

(1) Cuttings shall be collected at 10-foot intervals from surface to total well depth or at an interval approved by the department.

(2) Well cuttings shall be collected, described and logged as specified in the department's document titled "procedure for sample logging, procedure #: UICLPG-9," dated July 2002, which is hereby adopted by reference.

(3) The collection of cuttings shall be supervised by a licensed geologist or a licensed geologist's designee.

(4) The description and logging of the sample cuttings shall be performed by a licensed geologist.

(5) Each permittee shall submit a sample log and a dry sample set to the department within 45 days after the completion of the well.

(i) Each permittee shall provide a minimum of one core from each facility. The following provisions shall apply:

(1) Each permittee shall submit a plan describing the coring interval, coring procedures, and core testing to the secretary for review and consideration for approval, at least 60 days before the coring event.

(2) Each permittee shall make the core available for inspection upon request by the secretary.

(3) Any permittee may submit existing core data if the secretary determines that the core is representative of the geology of the area.

(j) Each permittee shall submit a water analysis for any water-bearing formation encountered in drilling a new monitoring well. The water shall be analyzed for the following parameters:

- (1) Chloride;
- (2) total dissolved solids; and
- (3) any parameter that the secretary determines could pose a potential threat to public health, safety, and the environment.

(k) Each permittee shall ensure that the stored hydrocarbons, formation water, lithology, and substances used in the solutioning of the storage caverns are compatible.

(l) Each permittee shall submit open-hole logs for any new underground hydrocarbon storage well. The logging interval shall be from the surface to 100 feet below the top of the salt section. At a minimum, the following logs shall be run:

- (1) A gamma ray log;
- (2) a neutron log if the source is registered in Kansas, or a sonic log;
- (3) a density log; and
- (4) a caliper log.

(m) Any permittee may use an alternative log if the secretary determines that the alternative log is substantially equivalent to one of the logs specified in subsection (l).

The permittee shall submit the following information:

- (1) A description of the log and the theory of operation for that log;
- (2) a description of the field conditions under which the log can be used;
- (3) the procedure for interpreting the log; and
- (4) an interpretation of the log upon completion of the logging event.

(n) Each permittee of a new underground hydrocarbon storage cavern shall maintain a minimum salt roof thickness of 100 feet above the washed storage cavern.

(o) Each permittee of an existing underground hydrocarbon storage cavern with a salt roof thickness greater than 50 feet but less than 100 feet shall meet the following provisions:

- (1) Each permittee shall use only saturated brine to displace product.
- (2) The permittee shall submit a schedule for monitoring brine salinity.
- (3) The salt roof thickness shall be monitored with gamma ray and density logs, or any other log specified in subsection (m), every three years.
- (4) Additional information, including a geomechanical study from core analysis, may be requested by the secretary to verify the integrity of the salt roof.

(p) Underground hydrocarbon storage caverns with a salt roof thickness of 50 feet or less shall be prohibited.

(q) Underground communication between underground hydrocarbon storage caverns in the upper 50 feet of the salt formation shall be prohibited.

(r) Underground communication between underground hydrocarbon storage caverns below the upper 50 feet of the salt formation shall be prohibited, unless the secretary determines that the communication is protective of public health, safety, and the environment. The permittee shall submit the following:

- (1) A sonar survey for each cavern that is in communication with another cavern; and

- (2) a plan describing the monitoring and testing that the permittee will conduct to ensure that the integrity of the underground hydrocarbon storage wells and caverns will be maintained.

(s) The horizontal distance separating new underground hydrocarbon storage caverns shall be at least 100 feet between cavern boundaries.

(t) Any existing underground hydrocarbon storage cavern with horizontal separation less than 100 feet may operate if the following requirements are met:

(1) Each permittee shall submit a justification for each existing underground hydrocarbon storage cavern with horizontal separation less than 100 feet. The following requirements shall apply:

(A) The justification shall include spacing-to-diameter ratios, cavern pressure differentials, and analyses of cavern shape, size, and depth.

(B) The horizontal spacing shall be reevaluated every five years.

(2) Horizontal spacing of less than 50 feet between caverns shall be prohibited.

(u) The maximum horizontal diameter of each cavern shall not exceed 300 feet.

(v) Each permittee shall ensure the integrity of the underground hydrocarbon storage wellhead, casing, and storage cavern before commissioning any new storage cavern into service. Storage operations may commence when the following requirements are met:

(1) Each permittee shall submit a notice of completion of construction on a form furnished by the department.

(2) Each new storage well shall be inspected by the secretary before storage operations commence. If the well fails the inspection, the permittee shall not commence storage operations. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Proposed New Regulations

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-7a. Public notice. (a) Public notice shall be given by the secretary for any of the following permit actions:

- (1) Any final permit application for an underground hydrocarbon storage well;
- (2) any modifications that require a draft permit as specified in K.A.R. 28-45-8a;
- (3) any modifications for an existing facility as specified in K.A.R. 28-45-8a;
- (4) the denial of a permit; or
- (5) a scheduled hearing.

(b) Public notice and, if applicable, a copy of the draft permit shall be mailed or electronically mailed by the department to the permit applicant.

(c) The public notice shall be mailed by the department to the following:

- (1) Any person who submits a written request for placement on the mailing list;
- (2) the official county newspaper of each county in which the lands affected by the application are located, for publication in at least two issues; and

(3) the Kansas register.

(d) The public notice shall include the following information:

(1) The name and address of the department processing the permit action for which the notice is being given;

(2) the name and address of the person or company seeking the permit;

(3) a brief description of the business conducted at the facility or the activity described in the permit application;

(4) the name, address, and telephone number of the departmental contact whom interested persons may contact for further information, including copies of the application, draft permit, or any other appropriate information;

(5) a brief description of the comment procedures for public notice; and

(6) a statement of the procedure to request a hearing and other procedures that allow public participation in the final permit decision.

(e) Any interested person may submit written comments to the secretary on any permit action during the 30-day public comment period. The following requirements shall apply:

(1) All comments shall be submitted by the close of the public comment period.

(2) All supporting materials submitted shall be included in full and shall not be incorporated by reference, unless the supporting materials are any of the following:

(A) Part of the administrative record in the same proceeding;

(B) state or federal statutes and regulations;

(C) state or environmental protection agency documents of general applicability;

or

(D) other generally available reference materials.

(3) Commentators shall make supporting materials not already included in the administrative record available to the secretary.

(f) The response to all significant comments concerning any permit actions and the reasons for changing any provisions in the draft permit shall be issued when the final permit decision is issued.

(g) The response to comments shall be made available to the public upon request.
(Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment
Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-8a. Modification and transfer of a temporary or a final permit. (a) The automatic transfer of a temporary or final permit shall be prohibited. The requirements for each permit transfer shall be as follows:

(1) Each person requesting a permit transfer shall submit a completed application to the secretary at least 60 days before the effective date of the proposed transfer.

(2) Each owner and each operator shall comply with the conditions of the existing permit until the secretary reissues the permit.

(b) Any temporary or final permit for an underground hydrocarbon storage well may be modified by the secretary under any of the following conditions:

(1) The secretary receives information that was not available when the permit was issued.

(2) The secretary receives a request for the modification of a permit.

(3) The secretary conducts a review of the permit file and determines that a modification is necessary.

(c) Only the permit actions subject to modification shall be reopened.

(d) Minor modifications that shall not require public notification include the following, except as otherwise specified:

(1) Correction of typographical errors;

- (2) requirements for more frequent monitoring or reporting by the permittee;
- (3) a date change in a schedule of compliance;
- (4) a change in ownership or operational control of the facility, unless the secretary determines that public notification is necessary to protect the public interest;
- (5) a change in construction requirements, if the secretary determines that the change is protective of public health, safety, and the environment; and
- (6) any amendments to a facility plugging plan.

(e) A draft permit and notification to the public shall be required if any of the following conditions is met:

(1) A permittee proposes substantial alterations or additions to the facility or proposes an activity that justifies a change in the permit requirements, including cumulative effects on public health, safety, or the environment.

(2) Information has become available that would have initially justified different permit requirements.

(3) Standards of regulations on which the permit was based have changed due to the promulgation of new or amended standards or due to a judicial decision after the permit was issued.

(f) Any permittee may request a permit modification within 180 days after any of the following:

- (1) The adoption of new regulations or standards;
- (2) any deadline to achieve compliance with regulations or standards before the expiration date of the permit; or

- (3) any judicial remand and stay of a promulgated regulation if the permit requirement was based on the remanded regulation. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-9a. Signatories for permit applications and reports. (a) Each permittee of an existing storage well and each applicant for a permit for a proposed storage well shall designate signatories to sign the permit applications and all reports required by the secretary.

(b) Positions that may be approved by the secretary to be signatories shall be the following:

- (1) Plant or operations manager;
- (2) cavern specialist;
- (3) superintendent; and
- (4) a position with responsibility at least equivalent to that required by the positions listed in this subsection.

(c) Any signatory may submit written notification to the secretary specifying a position having responsibility for the overall operation of the regulated facility or activity to act as a designated signatory.

(d) Each signatory and each signatory's designee shall submit a signature statement, on a form furnished by the department, to the secretary with the temporary and

the final permit applications. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-10a. Siting requirements for new underground hydrocarbon storage wells and facilities. (a) Each applicant shall assess the geographical, topographical, and physical data for any proposed underground hydrocarbon storage well location to determine whether siting requirements have been met. The following siting requirements shall be met:

(1) Each new underground storage facility shall be located at least three miles from the established boundaries of municipal population centers.

(2) Each proposed new facility or boundary expansion for an existing facility shall be located as follows:

(A) Not less than five miles from an active or abandoned conventional shaft mining operation; and

(B) not less than two miles from the facility's boundary of any solution mining operation.

(3) Each applicant shall assess the extent and nature of current or past conventional subsurface mining activities within five miles of the underground hydrocarbon storage facility's boundary to determine any potential impact to public health, safety, or the environment resulting from the proposed activities at the facility.

(4) Each applicant shall identify and assess all wells, including abandoned wells, from available sources of information, within a one-mile perimeter of the facility's boundary to determine if the following conditions exist:

(A) The wells have been constructed in a manner to protect public health, property, and the environment.

(B) The abandoned wells, including water, oil, gas, monitoring, and underground storage wells, have been properly plugged.

(b) Each applicant shall conduct a regional geological and evaluation to determine if the integrity of the proposed storage cavern will be adversely affected by either of the following:

(1) Salt thinning due to any stratigraphic change; or

(2) a dissolution zone in the bedded salt.

(c) Each applicant shall determine if the facility's location is in a floodplain or flood-prone area.

(d) No new underground hydrocarbon storage facility's boundary or the expansion of an existing facility's boundary shall be located less than one mile from any existing underground porosity storage facility.

(e) Each applicant shall identify potential risks to the storage operation from activities conducted at adjacent facilities.

(f) Each applicant shall identify all utilities having a right-of-way, including pipeline, railway, roadway, and electrical lines, and shall assess the potential impact of the utilities on the location or operation of the facility. If a facility is exposed and subject

to hazards, including vehicular traffic, railroads, electrical power lines, and aircraft or shipping traffic, the facility shall be protected from accidental damage, by distance or barricades.

(g) No outer boundary of an underground hydrocarbon storage cavern shall be less than 100 feet from any of the following:

(1) The property boundary of any owners who have not consented to subsurface storage under their property;

(2) any existing surface structure not owned by the facility's owner; or

(3) any public transportation artery. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-11a. Financial assurance for underground hydrocarbon storage facility closure.

(a) Each permittee of an underground hydrocarbon storage facility shall establish financial assurance for the following:

- (1) Closure of the facility; and
- (2) the plugging of any hydrocarbon storage well.

(b)(1) Each permittee of an existing underground hydrocarbon storage well shall submit proof of financial assurance to the secretary before April 1, 2004 and, thereafter, annually on or before January 31 of each year. Each applicant for a permit for a new underground hydrocarbon storage well shall submit proof of financial assurance with the final permit application and, thereafter, annually on or before January 31 of each year.

(2) Each permittee and each applicant shall meet the following requirements:

(A) Submit a detailed written estimate, in current dollars, of the cost to close all underground storage wells and storage caverns at the facility following the closure procedures specified in K.A.R. 28-45-20. The estimate shall be reviewed and approved by a licensed professional engineer or licensed geologist;

(B) prepare an estimate of the closure cost for all storage wells and storage caverns at the facility based on the cost charged by a third party to plug the underground storage wells; and

(C) increase the closure cost estimate and the amount of financial assurance provided if any change in the facility operation or closure plan increases the maximum cost of closure at any time.

(c) Each permittee shall provide continuous financial assurance coverage for closure until the secretary approves the facility closure.

(d) Each permittee shall comply with the provisions of the department's document titled "procedure for demonstrating financial assurance for an underground hydrocarbon storage well, procedure #: UICLPG-6," dated March 2003, which is hereby adopted by reference. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-12. Operations and maintenance plan. (a) Each permittee of an underground hydrocarbon storage facility shall submit a plan for the long-term operation and maintenance of the facility with the final permit application.

(b) Each operation and maintenance plan shall include the following information:

(1) A description of the methods to be used to prevent the overpressuring of wells and storage caverns;

(2) a plan view map of the location of any disposal wells and corrosion control wells; and

(3) the location, depth, and well construction for all shallow and deep groundwater monitoring and observation wells.

(c) Each permittee shall maintain at the facility and make available for inspection by the secretary the following information:

(1) A location map of all wells within the facility's boundaries and a listing of the global positioning system coordinates for each well;

(2) a schematic of the brine and product lines for each cavern; and

(3) a schematic of the gathering line system that connects all wells within the underground hydrocarbon storage facility to a central distribution point.

(d) Each permittee shall submit a plan for solutioning or washing any cavern to the secretary for review and consideration for approval. The plan shall include the following:

- (1) A list of acceptable blanket pad materials;
- (2) methods for monitoring the solutioning or washing process; and
- (3) a monitoring schedule.

(e) Only saturated brine shall be used to displace any product.

(f) The maximum allowable operating pressure and test pressure shall not exceed 0.8 pounds per square inch per foot of depth measured at the higher elevation of either the casing seat or the highest interior elevation of the storage cavern roof. The following requirements shall apply:

(1) A maximum allowable operating pressure exceeding 0.75 pounds per square inch per foot of depth shall be prohibited unless the following conditions are met:

(A) Each permittee submits a justification to the department for exceeding a maximum allowable operating pressure of 0.75 pounds per square inch per foot of depth.

(B) The well is equipped with a continuous pressure-monitoring system, and a pressure history can be maintained.

(2) The underground hydrocarbon storage cavern shall not be subjected to pressures in excess of the maximum allowable operating pressure, including pressure pulsations and abnormal operating conditions.

(g) Each permittee shall maintain a minimum operating pressure that is protective of cavern integrity at each underground hydrocarbon storage well.

(h) Each permittee shall meet the notification requirements in the facility's emergency response plan, give oral notification to the department within two hours, and submit written notification within one week to the department if any of the following events occurs:

(1) The overpressuring or the overfilling of an underground hydrocarbon storage cavern;

(2) the loss of integrity for an underground hydrocarbon storage well or cavern;

(3) the release of brine, product, or any other chemical parameter that poses a threat to public health, safety, or the environment;

(4) any uncontrolled or unanticipated loss of product or brine that is detectable by any monitoring or testing;

(5) any other condition that could endanger public health, safety, or the environment;

(6) the establishment of communication between underground hydrocarbon storage caverns;

(7) the triggering of any alarms verifying that the permit safety requirements have been exceeded; or

(8) any equipment malfunction or failure that could result in potential harm to public health, safety, or the environment.

(i) Each permittee shall notify the secretary of any change in the type of product stored in any underground hydrocarbon storage cavern and shall certify that the compatibility of product types and the effect of pressure changes will not adversely affect the wellhead, casing, tubing, and cavern. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-13. Emergency response plan and safety and security measures. (a) Each permittee of an existing underground hydrocarbon storage facility and each applicant who wishes to operate a facility shall prepare an emergency response plan. The following requirements shall apply:

(1) Each permittee of an existing underground storage facility shall maintain the emergency response plan at the facility before April 1, 2004 and shall make the plan available for inspection by the secretary.

(2) Each applicant for a final permit for a new underground hydrocarbon storage facility shall make the emergency response plan available for inspection by the secretary when the final permit application is submitted to the department.

(b) Each permittee shall update the plan annually and also shall update the plan whenever new information regarding the requirements for the emergency response plan becomes available.

(c) Each plan shall include a description of the facility's response to the following events:

- (1) Spills and releases;
- (2) fires and explosions;

(3) cavern subsidence and collapse; and

(4) any other activity that endangers public health and safety, or that constitutes a threat to the environment.

(d) Each plan shall include the following information:

(1) A description of the warning systems in operation at the facility;

(2) a description of the facility's emergency response communication system that includes the following:

(A) A plat showing the location of all occupied buildings within a two-mile perimeter of the facility's boundaries; and

(B) a list of addresses and telephone numbers for all persons to contact within a two-mile perimeter of the facility's boundaries if a release or emergency condition occurs;

(3) the procedures for coordination of emergency response with local emergency planning committees, including emergency notification and evacuation of citizens and employees;

(4) a description of employee training for emergency response;

(5) a plat of the facility, showing the following locations:

(A) All hydrocarbon storage wells;

(B) all underground injection control wells;

(C) all monitoring wells;

(D) all brine and product lines;

(E) railroad and transportation routes;

(F) brine ponds; and

(G) any other appurtenances at the facility; and

(6) a plan map of man-made surface structures and any construction activities within a one-mile perimeter of the facility's boundaries.

(e) A copy of the plan shall be available at the facility, the company headquarters, and any coordinating agencies or committees involved in the emergency response plan.

(f) Each permittee shall establish an educational program for community safety and awareness of the emergency response plan.

(g) Each permittee of an underground hydrocarbon storage facility shall provide security measures to protect the public and to prevent unauthorized access. These security measures shall include the following:

(1) Methods for securing the facility from unauthorized entry and for providing a convenient opportunity for escape to a place of safety;

(2) clearly visible, permanent signs at all points of entry and along the facility's boundary, identifying the well or storage facility name, owner, and contact telephone number;

(3) security lighting;

(4) alarm systems;

(5) appropriate warning signs in areas that could contain accumulations of hazardous or noxious vapors or where physical hazards exist; and

(6) a direct communication link with the local control room or any remote control center for service and maintenance crews.

(h) Warning systems and alarms shall consist of the following:

(1) Combustible gas detectors, heat sensors, pressure sensors, and emergency shutdown instrumentation integrated with warning systems audible and visible in the local control room and at any remote control center;

(2) circuitry designed so that the failure of a detector or heat sensor, excluding meltdown and fused devices, will activate the warning; and

(3) a manually operated alarm, audible to facility personnel.

(i) Each wellhead and storage cavern shall be protected with safety devices to prevent pressures in excess of the maximum allowable operating pressure from being exerted on the underground hydrocarbon storage well or cavern and to prevent the backflow of any stored hydrocarbon if a flowline ruptures.

(j) Each wellhead shall be equipped with manual isolation valves. Each port on a wellhead shall be equipped with either a valve or a blind flange. The valve or blind flange shall be rated at the same pressure as that for the wellhead.

(k) Each permittee shall install a supervisory control and data acquisition system approved by the secretary to monitor storage operations for individual storage wells. Each of the following instruments shall be connected to an alarm:

(1) Flow indicators for hydrocarbon;

(2) combustible gas detection indicators; and

(3) pressure indicators on both the product and brine lines of the wellhead.

(l) Each permittee shall install emergency shutdown valves on all hydrocarbon, brine, and water lines. Criteria for emergency shutdown valves shall include the following:

(1) (A) Be rated at least equivalent to 125% of the maximum pressure that could be exerted at the surface; or

(B) meet a pressure-rating standard equivalent to that specified to that in paragraph (l)(1)(A) and determined by the secretary to be protective of public health, safety, and the environment;

(2) fail to the closed position;

(3) be capable of remote and local operation; and

(4) be activated by the following:

(A) Overpressuring;

(B) underpressuring; and

(C) gas and heat detection.

(m) Each permittee shall conduct annual inspections of all wellhead instrumentation.

(n) Each permittee shall function-test each critical control system and emergency shutdown valve semiannually.

(o) Each permittee shall perform trip-testing of each loop, including the instrumentation, valves, shutdown equipment, and all wiring connections, to ensure the integrity of the circuit.

(p) Each permittee shall ensure that the equipment automatically closes all inlets and outlets to the storage cavern and safely shuts down or diverts any operation associated with the storage cavern, in case of overfilling or an emergency.

(q) Each permittee shall ensure that the automatic valve closure times meet the valve design limits for closure times.

(r) Each permittee shall cease operations or shall comply with the instructions from the secretary if the secretary determines that an imminent threat to public health, safety, or the environment exists due to any unsafe operating condition. The permittee may resume operations if the secretary determines that the facility's operations no longer pose a risk to public health, safety, or the environment. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-14. Design and construction of underground hydrocarbon storage wells. (a) Each permittee shall ensure that each underground hydrocarbon storage well is constructed with surface casing. The following requirements shall apply:

(1) The surface casing shall be set through all fresh and usable water formations and into competent bedrock.

(2) The surface casing shall be cemented by circulating cement through the bottom of the casing to the surface.

(3) The annular space between the casing and the formation shall be filled with cement.

(b) Each permittee of any existing underground hydrocarbon storage well without a surface casing shall perform the following:

(1) Verify the integrity of the existing casing with a casing inspection tool specified in K.A.R. 28-45-16; and

(2) (A) Provide double protection by installing either of the following:

(i) An intermediate casing and a production casing; or

(ii) a production casing with a tubing and packer assembly; or

(B) plug the well if double protection cannot be provided.

(c) Each permittee of a new underground hydrocarbon storage well shall install double casing protection with an intermediate casing and a production casing set into the upper part of the salt formation. The following provisions shall apply:

(1) The intermediate casing shall extend a minimum of 105 feet into the salt formation. The production casing shall extend at least to the depth of the intermediate casing.

(2) The annular space between the intermediate and production casings and between the intermediate casing and formation shall be filled with cement by circulating cement through the bottom of the casing to the surface.

(3) A tubing and mechanical packer assembly may be installed with the production casing as an alternative to the use of cemented intermediate and production casings.

(d) Each permittee of an existing underground hydrocarbon storage well that does not have double casing protection shall enhance casing monitoring by providing a casing inspection evaluation as specified in K.A.R. 28-45-16.

(e) The casing and tubing shall meet the performance standards for collapse resistance, internal yield pressure, and pipe body yield strength for the well's setting depths using criteria specified in the American petroleum institute's bulletin 5C2, twenty-first edition, dated October 1999, which is hereby adopted by reference.

(f) The brine tubing in each underground hydrocarbon storage well shall have a weep hole located a minimum of one foot above the bottom of the brine tubing. The following requirements shall apply:

(1) The brine tubing in a new underground hydrocarbon storage well shall have a weep hole before storage operations begin.

(2) The weep hole shall be added to the brine tubing in an existing underground hydrocarbon storage well when the brine tubing is pulled for any well work.

(g) Only new steel casing shall be installed in a new underground hydrocarbon storage well. Used parts, materials, and equipment that have been tested and certified for continued service may be used for repairs.

(h) Liners shall extend from the surface to a depth near the bottom of the production casing that allows room for workover operations.

(i) The following cementing requirements shall be met:

(1) The cement shall be compatible with the rock formation water and the drilling fluids. Salt-saturated cement shall be used when cementing through the salt section.

(2) The cement across the confining zone and to the surface shall have a compressive strength of not less than 1,000 pounds per square inch.

(3) Remedial cementing shall be completed if there is evidence of either of the following:

(A) Communication between the confining zone and other horizons; or

(B) annular voids that would allow either fluid contact with the casing or channeling across the confining zone or above the confining zone.

(4) The following requirements for cement evaluation shall apply:

(A) Samples shall be obtained at the start and end of the cementing operation for evaluation of cement properties. All cement samples collected shall be representative of the cement being utilized.

(B) All samples shall be tested for compressive strength.

(C) A cement bond log shall be run on the surface casing, intermediate casing, and cemented production casing after the neat cement has cured for a minimum of 72 hours.

(j) Casing patches shall be prohibited, unless the secretary determines that the use of casing patches is protective of public health, safety, and the environment. The following requirements shall apply:

(1) Each permittee shall submit a plan for the installation of the casing patch to the secretary.

(2) Each permittee shall meet the requirements specified in the department's document titled "procedure for internal casing repair, procedure #: UICLPG-12," dated February 2003, which is hereby adopted by reference.

(k) Each permittee shall pressure-test each production casing for leaks when the well construction is completed.

(l) Each permittee shall submit a casing inspection base log for the entire cased interval for the innermost casing string or for the cemented liner that extends the entire length of the casing after the well construction is completed.

(m) Each permittee shall contain, in a tank, all workover wastes, drilling fluids, drilling mud, and drill cuttings from any drilling operation or workover. Drilling fluids,

drilling mud, and drill cuttings shall be disposed of in a manner determined by the secretary to be protective of public health, safety, and the environment.

(n) A licensed professional engineer or a licensed geologist, or the licensed professional engineer's or licensed geologist's designee, shall supervise the installation of each underground hydrocarbon storage well.

(o) Each permittee shall install and maintain a corrosion control system. The following requirements shall apply:

(1) The corrosion control system shall be capable of protecting the well casings.

(2) The corrosion control system shall be assessed according to the protocol and time schedule recommended by the corrosion control system manufacturer, and the results shall be reported to the secretary. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Proposed New Regulations

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-15. Monitoring. (a) Each permittee shall install pressure sensors to continuously monitor wellhead pressures for both the product and brine sides of the wellhead for each underground hydrocarbon storage well. The following requirements shall apply:

(1) The pressure sensor shall be capable of recording the maximum and minimum operating pressures during a 24-hour period.

(2) The pressure sensor shall be capable of recording operating pressures at an interval approved by the secretary.

(3) Each permittee shall provide pressure data, including historic continuous monitoring, to the secretary upon request.

(4) Each underground hydrocarbon storage well shall have pressure gauges on both the product and brine sides at the wellhead, until continuous monitoring pressure sensors are installed.

(b) Each permittee of an underground hydrocarbon well equipped with a production casing with a tubing and packer assembly shall monitor the annular space. Each permittee shall submit the following to the secretary for review and consideration for approval:

(1) A diagram of the well construction; and

(2) a plan for monitoring the annulus that includes the following:

(A) A diagram of the instrumentation for monitoring the annular pressure and fluid levels;

(B) a description of how the annular pressure and fluid levels will be recorded; and

(C) a description of, and justification for, the testing methods to demonstrate the mechanical integrity of the system.

(c) Each permittee shall submit a plan for any monitoring activity, including logging and sonar surveys, to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment , at least 60 days before the commencement of these monitoring activities.

(d) Each permittee shall submit a summary and the results of the monitoring activity to the secretary within 30 days after completion of the monitoring activity.

(e) Each permittee shall monitor the thickness of the salt roof for each cavern with a gamma ray log and a density log, or with another log as specified in K.A.R. 28-45-6a (m), as follows:

(1) Every five years;

(2) every three years, if the cavern meets criteria specified in K.A.R. 28-45-6a;

(3) at any time that the secretary determines that cavern integrity is suspect; and

(4) before plugging the well.

(f) Each permittee shall monitor the cavern storage capacity and the cavern geometry with a sonar survey. The sonar survey shall be conducted as follows:

- (1) Before placing the underground hydrocarbon storage cavern in service;
 - (2) every 10 years;
 - (3) for determining the stability of the cavern and the overburden if the salt roof thickness and cavern geometry indicate that the stability of the cavern or overburden is at risk;
 - (4) after any growth of the cavern that results in a solution volume increase of 20 percent or more of cavern capacity; and
 - (5) before plugging the well if a sonar survey has not been run in the past five years.
- (g) Any permittee may use an alternative method for the sonar survey if the secretary determines that the alternative method is substantially equivalent to the method specified in subsection (f). The permittee shall submit the following information for the secretary's consideration:
- (1) A description of the proposed method and the theory for its operation;
 - (2) a description of the storage well and cavern conditions under which the log can be used;
 - (3) the procedure for interpreting the survey results; and
 - (4) an assessment of the capacity and stability of the cavern upon completion of the survey.
- (h) Each permittee shall submit a ground subsidence monitoring plan to the secretary.

The following requirements shall apply:

- (1) Each permittee shall submit the plan at either of the following times:
 - (A) When the final permit application is submitted; or

(B) when the permittee conducts an elevation survey that is due before submittal of the final permit application.

(2) The ground subsidence monitoring plan shall include the following information:

(A) A description of the method for conducting an elevation survey; and

(B) the criteria for establishing monuments, benchmarks, and wellhead survey points.

(3) The criteria for subsidence monitoring shall be as follows:

(A) Level measurements to the accuracy of 0.01 foot shall be made.

(B) Surface elevation changes in excess of 0.10 foot shall be reported within 24 hours to the secretary.

(C) No established benchmark shall be changed, unless the permittee submits a justification that the change is protective of public health, safety, and the environment.

(D) If a benchmark is changed, the elevation change from the previous benchmark shall be noted in the elevation survey report.

(E) Each permittee shall submit the elevation before and after any wellhead work that results in a change in the survey point at the wellhead.

(4) The elevation survey shall be conducted by a licensed professional land surveyor.

(5) Biennial survey results, including certified and stamped field notes, shall be submitted to the department within 30 days after completion of the survey.

(i) Each permittee shall submit an inventory balance plan for measuring the volume of hydrocarbons injected into or withdrawn from each underground hydrocarbon storage well,

including methods for measuring and verifying volume, with the permit application to the secretary for review and consideration for approval. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Proposed New Regulations

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-16. Testing and inspections. (a) Each permittee shall submit a plan to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment, before conducting any underground hydrocarbon storage well or cavern testing. Testing shall not commence without prior approval from the secretary.

(b) Each permittee shall submit a summary of the testing to the secretary within 45 days after completing the test. The summary shall include the following:

- (1) A chronology of the test;
- (2) copies of all logs;
- (3) storage well completion information;
- (4) pressure readings;
- (5) volume measurements; and
- (6) an explanation of the test results.

(c) Each permittee shall test each unplugged underground hydrocarbon storage well and cavern for mechanical integrity. The following requirements shall apply:

- (1) Integrity tests shall be conducted on the storage well and cavern as follows:

(A) Before the cavern is initially placed in service;

(B) every five years, if the well is unplugged;

(C) before the underground hydrocarbon storage cavern is placed back in service after being in monitoring status, unless the mechanical integrity test has been performed in the last five years; and

(D) before the well is plugged, unless the mechanical integrity test has been performed in the last five years.

(2) Integrity tests shall be conducted on the underground hydrocarbon storage well after each workover that involves physical changes to any cemented casing string.

(3) Each underground hydrocarbon storage well shall be tested for mechanical integrity using a nitrogen-brine interface method.

(4) Each underground hydrocarbon storage cavern shall be tested for integrity by using a hydrostatic brine test.

(5) Each permittee shall submit a test procedure plan, on a form furnished by the department, to the secretary for review and consideration for approval, at least 30 days before test commencement. The plan shall include the following information:

- (A) The justification for test parameters;
 - (B) the test sensitivities; and
 - (C) the pass and fail criteria for the test.
- (6) Each permittee shall notify the secretary at least five days before conducting any integrity test.

(7) The integrity test shall be conducted at the maximum allowable operating pressure.

(8) All test procedures shall use certified gauges and pressure transducers that have been calibrated annually.

(d) Any permittee may use an alternative integrity test if the secretary determines that the alternative integrity test is substantially equivalent to the integrity tests specified in subsection (c). The permittee shall submit the following information for the secretary's consideration:

(1) A description of the test method and the theory of operation, including the test sensitivities, a justification for the test parameters, and the pass and fail criteria for the test;

(2) a description of the well and cavern conditions under which the test can be conducted;

(3) the procedure for interpreting the test results; and

(4) an interpretation of the test upon completion of the test.

(e) No underground hydrocarbon storage well and cavern shall be used for storage if the mechanical integrity is not verified.

(f) Each permittee shall submit a casing evaluation for each underground hydrocarbon storage well. Acceptable casing evaluation methods shall include magnetic flux and ultrasonic imaging.

(g) Any permittee may use an alternative casing evaluation method if the secretary determines that the alternative casing evaluation method is substantially

equivalent to the casing evaluation methods specified in subsection (f). The permittee shall meet the following requirements:

(1) Each permittee shall submit a description of the logging method, including the theory of operation and the well conditions suitable for log use.

(2) Each permittee shall submit the specifications for the logging tool, including tool dimensions, maximum temperature and pressure rating, recommended logging speed, approximate image resolution, and hole size range.

(3) Each permittee shall describe the capabilities of the log for determining the following:

(A) The presence of any metal loss due to either of the following:

(i) Internal or external corrosion; or

(ii) internal wear;

(B) the degree of penetration of the corrosion or the casing defect; and

(C) the circumferential extent of the corrosion or the casing defect.

(4) Each permittee shall submit a log and an interpretation of the log to the secretary.

(h) Each permittee shall submit a casing evaluation according to the following time schedule:

(1) Every 10 years, for either of the following conditions:

(A) The underground hydrocarbon storage well has double casing protection; or

(B) an existing well has a liner and a production casing;

(2) after any workover involving the cemented casing; and

(3) every five years, if the underground hydrocarbon well does not have double casing protection or if a determination is made by the secretary that the integrity of the long string casing could be adversely affected by any naturally occurring condition or man-made activity.

(i) A variance for submitting a casing evaluation may be considered by the director if the well has a tubing and packer assembly in place.

(j) Each permittee shall submit a cement bond log with the casing evaluation if a cement bond log has not been previously submitted.

(k) A licensed professional engineer or licensed geologist, or licensed professional engineer's or licensed geologist's designee, shall supervise all test procedures and associated field activity.

(l) Each permittee shall have a licensed professional engineer or licensed geologist review all test results.

(m) Each permittee shall visually inspect the wellhead monthly for any leakage.

(n) Each permittee shall conduct an inspection of facility records, using a form furnished by the department, every two years to ensure that the required records are being properly maintained. The permittee shall maintain these records at the facility and shall make the records available to the secretary upon request. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-17. Groundwater monitoring. (a) Each permittee of an underground hydrocarbon storage facility shall submit a groundwater monitoring plan with the final permit application to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment.

(b) Each permittee shall ensure that the groundwater monitoring wells meet the following requirements:

(1) Each permittee shall set the screen in each shallow monitoring well at a depth that is inclusive of the seasonal fluctuation of the water table.

(2) Each permittee shall ensure that all deep groundwater monitoring wells extend a minimum of 25 feet into the bedrock, or to a depth based on the geology and hydrogeology at the facility and approved by the secretary to ensure the protection of public health, safety, and the environment.

(c) All well locations and the spacing between all well locations shall be based on the geology and the hydrogeology at the facility and shall be required to be approved by the secretary to ensure the protection of public health, safety, and the environment.

(d) Each permittee of a facility shall submit a quality assurance plan, including techniques for sampling and analysis, with the final permit application to the secretary for

review and consideration for approval to ensure the protection of public health, safety, and the environment.

(e) Each permittee shall collect groundwater samples and analyze the samples for chlorides and any other parameter determined by the secretary to pose a threat to public health, safety, and the environment. The reporting format shall be determined by the secretary.

(f) Each permittee shall submit the results for chloride analyses from groundwater samples to the department on a quarterly basis.

(g) Each permittee shall monitor monthly for the presence of combustible gas in the headspace in monitoring wells and shall submit the results to the department quarterly.

(h) Each permittee shall submit a static groundwater level measurement for each monitoring well with the quarterly chloride analyses results specified in subsection (f).

(i) Any permittee of a facility where chloride concentrations in the groundwater exceed 250 milligrams per liter may be required by the secretary to submit a work plan, for review and consideration for approval, that describes the methods to delineate potential source areas and to control migration of the chloride contamination.

(j) Each permittee of a well in which combustible gas is detected shall submit a work plan to the secretary for review and consideration for approval. Each permittee shall describe the proposed methods to eliminate any source areas and return the combustible gas levels to levels that do not pose a potential threat to public health, safety, or the environment. The plan shall be approved if the secretary determines that the plan

is protective of public health, safety, and the environment. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-18. Record requirements and retention. (a) Each permittee shall complete and submit an annual report, on a form furnished by the department, on or before April 1 of each year. The annual report shall include the following:

- (1) A description of any incident of uncontrolled or unanticipated product loss;
- (2) the well number and date of any logs or sonar surveys conducted;
- (3) the estimated storage capacity for all unplugged caverns;
- (4) a list of any caverns being washed;
- (5) a list of the volume of product injected and withdrawn for each well;
- (6) a list, by well number, of the type of product stored; and
- (7) a list, by well number, of the maximum and minimum product storage pressures encountered during the report year.

(b) Each permittee shall maintain facility records at the facility or at a location approved by the secretary for the following time periods:

- (1) A period of 10 years, for the following records:
 - (A) The maximum and minimum operating pressures for each well; and
 - (B) the annual inspections required by the secretary;
- (2) the life of the well, for the following records:

- (A) The casing records for each well;
 - (B) the cementing records for each well;
 - (C) the workover records;
 - (D) monitoring information, including calibration and maintenance records; and
 - (E) continuous monitoring data; and
- (3) the life of the facility, for the following records:
- (A) All logging events;
 - (B) all mechanical integrity tests and other testing;
 - (C) all groundwater monitoring data; and
 - (D) all correspondence relating to the permit, including electronic mail.
- (c) Surface elevation surveys shall be maintained and retained for the life of facility plus 20 years after the facility's closure.
- (d) All required facility records, reports, and documents shall be transferred to the new permittee with the transfer of the permit. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-19. Well workovers. (a) Each permittee shall submit a workover plan to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment. The following provisions shall apply:

(1) Each permittee shall submit the workover plan at least 10 days before performing any downhole or wellhead work that involves dismantling or removal of the wellhead.

(2) A permittee shall not be required to submit a workover plan for routine maintenance or replacement of gauges, sensors, or valves.

(3) Verbal authorization to initiate downhole or wellhead work may be issued by the secretary if the permittee has fulfilled the requirements of this subsection.

(b) Each permittee shall ensure that a blowout preventer with a pressure rating greater than the pressures anticipated to be encountered is used during each workover.

(c) Each permittee shall ensure that all logging procedures are conducted through a lubricator unit with a pressure rating greater than the pressures anticipated to be encountered.

(d) Each permittee shall provide to the person logging the well or performing a well workover all relevant information concerning the status and condition of the well

and storage cavern before initiating any work. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-20. Plugging requirements. (a) Each permittee shall submit a plugging plan, including monitoring and testing requirements, to the secretary for review and consideration for approval at least 60 days before the plugging event.

(b) Each permittee shall follow the plugging procedure specified in the department's document titled "procedure for the plugging and abandonment of a hydrocarbon storage well, procedure #:UICLPG-3," dated March 2003, which is hereby adopted by reference.

(c) Each permittee shall restore and preserve the integrity of the site as follows:

(1) Dispose of all liquid waste in an environmentally safe manner;

(2) clear the area of debris;

(3) drain and fill all excavations;

(4) remove all unused concrete bases, machinery, and materials; and

(5) level and restore the site. (Authorized by and implementing K.S.A. 2002

Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-21. Underground hydrocarbon storage fees. (a) Effective on and after January 1, 2004, each permittee shall submit an annual permit fee of \$18,890 per facility and \$305 per unplugged storage well on or before April 1 of each year.

(b) Each permittee shall submit a permit fee of \$305 for any unplugged storage well inadvertently omitted from the collection of permit fees for the year 2003.

(c) Each applicant for a permit for a proposed new underground hydrocarbon storage well shall submit a fee of \$700 with the permit application.

(d) Fees shall be made payable to the “Kansas department of health and environment – subsurface hydrocarbon storage fund.”

(e) The fees collected under the provisions of this regulation shall not be refunded.

(f) If ownership of an underground hydrocarbon storage well or underground hydrocarbon storage facility changes during the term of a valid permit, no additional fee shall be required unless a change occurs that results in a new storage well or an expanded facility operation. (Authorized by and implementing K.S.A 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-22. Permit required for a brine pond. (a) Since the underground storage of hydrocarbons and the access to and transfer of hydrocarbons is dependent on the safe and secure operation and maintenance of associated brine ponds, no person shall construct, operate, or maintain any brine pond associated with an underground hydrocarbon storage facility without obtaining a brine pond permit from the secretary.

(b) Each permittee of a brine pond in existence before April 1, 2003 shall meet the requirements for liner construction if either of the following conditions exists:

- (1) A potential threat to public health, safety, or the environment exists.
- (2) An existing brine pond is dewatered due to the repair, replacement, or expansion of the brine pond.

(c) A variance may be granted by the secretary if both of the following conditions are met:

- (1) The variance is protective of public health, safety, and the environment.
- (2) The applicant or permittee agrees to perform any additional monitoring or brine pond improvements, or both, if required by the secretary.

(d) Each applicant or permittee seeking a variance shall submit a written request, including a justification for the variance and any supporting data, to the secretary for review and consideration for approval. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-23. Brine pond application and permit. (a) Each permittee of an existing brine pond and each applicant for a permit for a new brine pond shall submit an application for a permit to the secretary. Upon review of the application, either of the following shall be issued by the secretary:

(1) A final permit if the application is approved; or
(2) a notice that the permit has been denied if the applicant has not complied with the requirements of this article of regulations. The notice shall include justification for the permit denial.

(b) Each permit for a brine pond shall be authorized for a term not to exceed 10 years.

(c) Each permittee of an existing brine pond shall submit an application, on a form furnished by the department, to the secretary within six months after April 1, 2003.

(d) Each permittee shall submit a completed application to renew a permit not less than 90 days before the expiration date of the permit in effect.

(e) Each applicant for a permit for a new brine pond shall submit a completed application to the secretary not less than 90 days before the construction of the new brine

pond commences. Brine pond construction shall not begin until the secretary has issued the permit.

(f) Each permit application for a new brine pond shall include a hydrogeological investigation conducted under the direction of a licensed geologist or a licensed professional engineer.

(g) Each hydrogeological investigation for a new brine pond shall include the following information:

(1) A site characterization for brine pond construction shall meet the following requirements:

(A) The bottom of the brine pond shall be determined by the lowest surface elevation of compacted or excavated soils used in creating the pond structure.

(B) All required excavations or boreholes shall be drilled to a depth of at least 10 feet below the bottom of the brine pond.

(C) A separation distance of at least 10 feet shall be maintained between the brine pond bottom and the water table.

(D) The surface area shall be measured at the interior top dike elevation.

(2) The location and elevation of each borehole or excavation, based on surface area, shall be determined by the following criteria:

(A) A minimum of two boreholes or excavations for each five acres of proposed brine pond surface area; or

(B) a minimum of two boreholes or excavations if the brine pond surface area is less than five acres.

(3) The following information shall be submitted for each borehole or excavation:

- (A) A log of soil types encountered in each borehole or excavation; and
 - (B) a groundwater level measurement at each borehole or excavation.
- (h) Each permittee shall notify the department at least five days before conducting any field activities for the hydrogeological investigation. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-24. Public notice for a brine pond. (a) Public notice shall be given by the secretary for the following permit actions:

(1) A permit application for any new brine pond associated with an underground hydrocarbon storage well;

(2) modifications that require a draft permit;

(3) modifications to an existing brine pond;

(4) a denied permit; and

(5) a scheduled hearing.

(b) The public notice and, if applicable, a copy of the draft permit shall be mailed or electronically mailed by the department to the permit applicant.

(c) The public notice shall be mailed by the department to the following:

(1) Any person who submits a written request for placement on the mailing list;

(2) the official county newspaper of each county in which the lands affected by the application are located, for publication in at least two issues; and

(3) the Kansas register.

(d) The public notice shall include the following information:

(1) The name and address of the department processing the permit action for which the notice is being given;

(2) the name and address of the person seeking the permit;

(3) a brief description of the activity described in the permit application;

(4) the name, address, and telephone number of the person that interested persons may contact for further information, including copies of the application, draft permit, or other appropriate information;

(5) a brief description of the comment procedures for public notice; and

(6) a statement of the procedure to request a hearing and other procedures that allow public participation in the final permit decision.

(e) Any interested person may submit written comments to the secretary on any permit action during the 30-day public comment period. The following requirements shall apply:

(1) Comments shall be submitted by the close of the public comment period.

(2) All supporting materials submitted shall be included in full and shall not be incorporated by reference, unless the supporting materials are any of the following:

(A) Part of the administrative record in the same proceeding;

(B) state or federal statutes and regulations;

(C) state or environmental protection agency documents of general applicability;

or

(D) other generally available reference materials.

(3) Commentators shall make available to the secretary all supporting materials not already included in the administrative record.

(f) The response to all significant comments concerning any permit actions and the reasons for changing any provisions in the draft permit shall be issued at the time that the final permit decision is issued.

(g) The response to comments shall be made available to the public upon request.
(Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003;effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-25. Renewal, modification, and transfer of a brine pond permit. (a) The issuance or modification of a brine pond permit or the variance of the specific requirements of a brine pond permit may be authorized by the secretary for a term of less than 10 years.

(b) The automatic transfer of a brine pond permit shall be prohibited. The terms of a permit transfer shall include the following:

(1) Each person requesting a permit transfer shall submit a completed application to the secretary at least 60 days before the proposed effective date of the transfer.

(2) Each permittee shall comply with the conditions of the existing permit until the secretary reissues the permit.

(c) Any permit for a brine pond may be modified by the secretary for any of the following reasons:

(1) The secretary receives information not available when the permit was issued.

(2) The secretary receives a request for a modification.

(3) The secretary conducts a review of the permit file and determines that a modification is necessary.

(d) Only the permit actions subject to modification shall be reopened.

(e) Minor modifications that shall not require public notification shall include the following:

- (1) Correction of typographical errors;
- (2) requirements for more frequent monitoring or reporting by the permittee;
- (3) date change in a schedule of compliance;
- (4) change in ownership or operational control of the facility, unless the secretary determines that public notification is necessary to protect the public interest;
- (5) change in construction requirements, if approved by the secretary; and
- (6) amendments to a brine pond closure plan.

(f) A draft permit and notification to the public shall be required if any of the following conditions is met:

(1) A permittee proposes substantial alterations to the brine ponds or proposes any activity that justifies a change in permit requirements, including cumulative effects on public health, safety, or the environment.

(2) Information has become available that would have initially justified different permit conditions.

(3) The standards or regulations on which the permit was based have changed because of the promulgation of new or amended standards or because of a judicial decision.

(g) Any permittee may request a permit modification within 180 days after any of the following:

- (1) The adoption of any new regulations or standards;

(2) any deadline to achieve compliance with regulations or standards before the expiration date of the permit; or

(3) any judicial remand and stay of a promulgated regulation, if the permit condition was based on the remanded regulation. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T- 23-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-26. Signatories for brine pond permit applications and reports. (a) Each permittee of an existing brine pond and each applicant for a permit for a new brine pond shall designate signatories to sign the permit applications and reports required by the secretary.

(b) Positions that may be approved by the secretary as signatories shall include either of the following:

- (1) Operations manager;
- (2) brine pond specialist; or
- (3) a position with responsibility at least equivalent to that required by the positions listed in this subsection.

(c) Any signatory may submit written notification to the secretary specifying a position having responsibility for the overall operation of the regulated facility or activity to act as a designated signatory.

(d) Each signatory and each signatory's designee shall submit a signature statement, on a form furnished by the department, to the secretary with the brine pond permit application. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-27. Financial assurance for brine pond closure. (a) Each permittee of a brine pond shall establish financial assurance for the decommissioning and abandonment of any brine pond permitted by the secretary under this article of regulations.

(b) (1) Each permittee of an existing brine pond shall submit proof of financial assurance before April 1, 2004 and, thereafter, annually on or before January 31 of each year. Each applicant for a permit for a new brine pond shall submit proof of financial assurance to the secretary with the permit application and, thereafter, annually on or before January 31 of each year.

(2) Each permittee and each applicant shall meet the following requirements:

(A) Submit a detailed written estimate, in current dollars, of the cost to close any brine pond at the facility. The estimate shall be reviewed and approved by a licensed professional engineer or licensed geologist;

(B) develop an estimate of the closure cost for each brine pond at the facility as follows:

(i) The estimate shall be based on the cost charged by a third party to properly decommission the brine pond; and

(ii) the brine pond shall be assumed to be at maximum storage capacity; and

(C) increase the closure cost estimate and the amount of financial assurance provided if any change in the brine pond closure plan or in the operation increases the maximum cost of brine pond closure at any time.

(c) Each permittee shall provide continuous financial assurance coverage for closure until the secretary approves the brine pond closure.

(d) Each permittee shall comply with the provisions of the department's document titled "procedure for demonstrating financial assurance for a brine pond associated with a storage facility, procedure #: UICLPG-11," dated March 2003, which is hereby adopted by reference. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-28. Design, construction, and maintenance of brine ponds. (a) Each applicant shall submit a design and construction plan for each new brine pond associated with an underground hydrocarbon storage facility to the secretary. The design and construction plan shall be approved if the secretary determines the plan is protective of public health, safety, and the environment. Each brine pond shall be designed by a licensed professional engineer.

(b) Each applicant shall ensure that the impermeable synthetic membrane liner system for each brine pond is comprised of primary and secondary impermeable synthetic membrane liners with an intermediate leak detection system. The following requirements shall apply:

- (1) The primary and secondary liners shall be at least 30 mils in thickness.
- (2) The engineer designing the brine pond shall obtain a certification from the liner manufacturer providing the following information:
 - (A) Confirmation that the specified liner is compatible for use with the brine;
 - (B) confirmation that the specified liner is ultraviolet-resistant; and
 - (C) data for the manufacturer's estimated leakage, permeability, or transmissivity rate for specific liners, including the rate of movement of fluids through the synthetic

membrane liner due to the properties and thickness of the liner material, expressed in units of volume per area per time;

(D) any normally expected manufacturing defects in the liner material; and

(E) any normally expected defects associated with the seaming and installation process.

(c) Each permittee of an existing brine pond and each applicant for a permit for a new brine pond shall submit a contingency plan to the secretary that outlines the procedures for brine containment issues associated with brine pond maintenance and dewatering due to liner failure, repair, replacement, or expansion of the brine pond. The contingency plan shall be approved if the secretary determines that the plan is protective of public health, safety, and the environment.

(d) Each permittee of an existing brine pond and each applicant for a permit for a new brine pond shall submit a flood response plan if the brine pond is located in a floodplain or a flood-prone area.

(e) Each permittee shall immediately cease operations or shall comply with instructions from the secretary if the secretary determines that an imminent threat to public health, safety, or the environment exists due to any unsafe operating condition. The permittee may resume operations if the secretary determines that the brine pond operations no longer pose a risk to public health, safety, or the environment.

(f) Each permittee shall ensure that the primary and secondary liners for each brine pond are separated to provide a conduit for the movement of any fluid between the liners to the leak detection monitoring location for detection and removal.

(g) Each permittee shall ensure that all materials between the primary and secondary liners are capable of transmitting a minimum of 1/64 inch per acre per day of flow with a head of no more than two feet placed on the secondary liner. Acceptable materials shall include the following:

- (1) Clean sand;
- (2) pea gravel;
- (3) geotextile fabric;
- (4) geonet-type material; and
- (5) any alternatives recommended by the liner manufacturer, if the secretary determines that the alternatives are substantially equivalent to materials listed in this subsection.

(h) Each permittee shall ensure that the leak detection system design for each brine pond limits the maximum travel time required for fluid penetrating the liner to reach the leak detection monitoring location to 24 hours or less.

(i) Each permittee shall ensure that each brine pond bottom has a slope adequate for the proper operation of the leak detection system with not less than 0.5 percent for the slope for the collection pipes and 1.0 percent for all other slopes.

(j) Each permittee shall ensure that the dewatering system design for each brine pond is capable of the following:

- (1) Monitoring the volume of fluid removed from the intermediate space between the primary and secondary liners; and

(2) pumping the volume of fluid generated equal to 10 times the maximum allowable liner leakage rate.

(k) Each permittee shall ensure that the compaction of all brine pond embankments and of the upper six inches of the interior lagoon bottom below the secondary liner meets all of the following criteria:

(1) The maximum standard proctor density shall be a minimum of 95 percent at optimum moisture to optimum moisture plus three percent.

(2) The maximum thickness of the compacted material shall not exceed six inches.

(3) The moisture content range of the compacted soils shall be optimum moisture to optimum moisture plus three percent.

(4) The maximum size of dirt clods in the compacted soil shall be less than one inch in diameter.

(l) Each permittee shall ensure that the following requirements for the installation of the liners at each brine pond are met:

(1) The primary and secondary liners shall be anchored at the top of the brine pond dike in accordance with the liner manufacturer's instructions.

(2) Installation shall be performed in accordance with the liner manufacturer's instructions.

(3) Installation shall be performed by a contractor experienced in the installation of impermeable synthetic membrane liners.

(4) On-site supervision of the liner installation shall be provided by an individual that has experience in liner installation practices.

(m) Each permittee shall ensure that the volume of fluid monitored from the intermediate leak detection system at the brine pond is based on a rate of 10 percent of leak return system capacity and does not exceed 1,000 gallons per day per acre of pond area.

(n) Each permittee shall submit, to the secretary, a seam testing method to verify the adequacy of the seaming process for the liners at each brine pond. The following requirements shall apply:

(1) The testing method shall include the following:

(A) The methods for destructive and nondestructive seam testing;

(B) the protocol describing the number of tests per lineal foot of field seam;

(C) the size of the destructive test specimen required; and

(D) other pertinent quality control provisions recommended by the liner manufacturer.

(2) All field seams shall be subjected to nondestructive testing.

(o) Each permittee shall install a gas vapor control system to ignite or capture hydrocarbon vapors at each brine pond within five years after April 1, 2003. The gas vapor control system shall consist of one of the following:

(1) A hydrocarbon liquid knockout vessel and degassifier; or

(2) an alternative method if the secretary determines that the alternative method is substantially equivalent to the hydrocarbon liquid knockout vessel and degassifier.

(Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-29. Groundwater monitoring for brine ponds. (a) Each permittee of an existing brine pond and each applicant for a permit for a new brine pond shall submit a groundwater monitoring plan with the brine pond permit application to the secretary for review and consideration for approval. The monitoring plan shall be approved if the secretary determines that the plan is protective of public health, safety, and the environment.

(b) Each permittee of an existing brine pond and each applicant for a permit for a new brine pond shall meet the following requirements:

(1) Install monitoring wells around the perimeter of the brine pond. The well spacing shall be based on the geology and hydrogeology at the facility and shall be approved by the secretary if the secretary determines that the well spacing is protective of public health, safety, and the environment; and

(2) set the screen in all shallow groundwater monitoring wells at a depth that is inclusive of the seasonal fluctuation of the water table.

(c) Each permittee of an existing brine pond and each applicant for a permit for a new brine pond shall submit, with the groundwater monitoring plan, a quality assurance

plan to the secretary for review and consideration for approval to ensure the protection of public health, safety, and the environment.

(d) Each permittee shall collect groundwater samples and analyze the samples for chloride and any other parameter determined by the secretary as posing a potential threat to public health, safety, and the environment. The reporting format shall be determined by the secretary.

(e) Each permittee shall submit the results for the chloride analyses from groundwater samples to the department on a quarterly basis.

(f) Each permittee shall monitor monthly for the presence of combustible gas in the headspace in monitoring wells and submit the results to the department on a quarterly basis.

(g) Each permittee shall submit a static groundwater level measurement for each monitoring well with the quarterly chloride analyses specified in subsection (e).

(h) Any permittee of a brine pond where chloride concentrations in the groundwater exceed 250 milligrams per liter may be required by the secretary to submit a work plan, for review and consideration for approval, that describes proposed methods to delineate the extent of the contamination and to control migration of the chloride contamination. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003 .)

Kansas Department of Health and Environment

Article 45. Underground Hydrocarbon Storage Wells and
Associated Brine Ponds

28-45-30. Brine pond closure requirements. (a) Each brine pond permittee shall submit a closure plan, including monitoring and testing requirements, to the secretary for review and consideration for approval at least 60 days before the closure of a brine pond. The closure plan shall be approved if the secretary determines that the closure plan is protective of public health, safety, and the environment.

(b) The permittee shall not commence closure activities without the secretary's approval.

(c) Each permittee shall include the following information in the brine pond closure plan:

(1) The procedure for deactivating the various brine lines employed at the facility;

(2) the procedures for the remediation, removal, or disposal of brine, accumulated sludge in the brine pond, contaminated soils, and contaminated groundwater;

(3) a description regarding the proposed maintenance, deactivation, conversion, or demolition of the brine pond structure; and

(4) procedures addressing the plugging of any water wells or groundwater monitoring wells associated with the brine pond. (Authorized by and implementing K.S.A. 2002 Supp. 55-1,117; effective, T-28-4-1-03, April 1, 2003; effective Aug. 8, 2003.)